

Supporting Information
For
**Preparation and characterization of potassium nickel
hexacyanoferrate loaded hydrogel beads for the
removal of cesium ions**

Charu Dwivedi ^a, Sanjay K. Pathak ^b, Manmohan Kumar ^{a}, Subhash C. Tripathi^b and Parma N.
Bajaj ^a*

^a Radiation & Photochemistry Division, ^b Fuel Reprocessing Division

Bhabha Atomic Research Centre, Trombay, Mumbai-400 085, India

E-mail*: manmoku@barc.gov.in; Phone: (+) 91-22- 25593994, Fax :(+) 91-22- 25505151

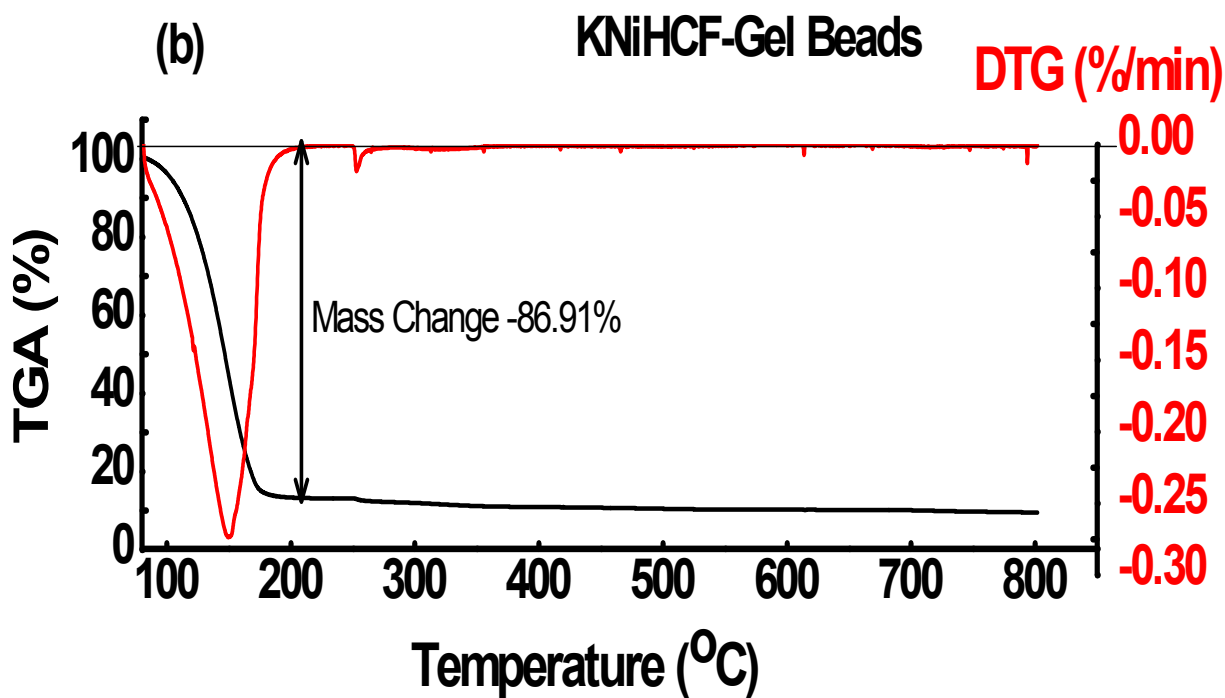
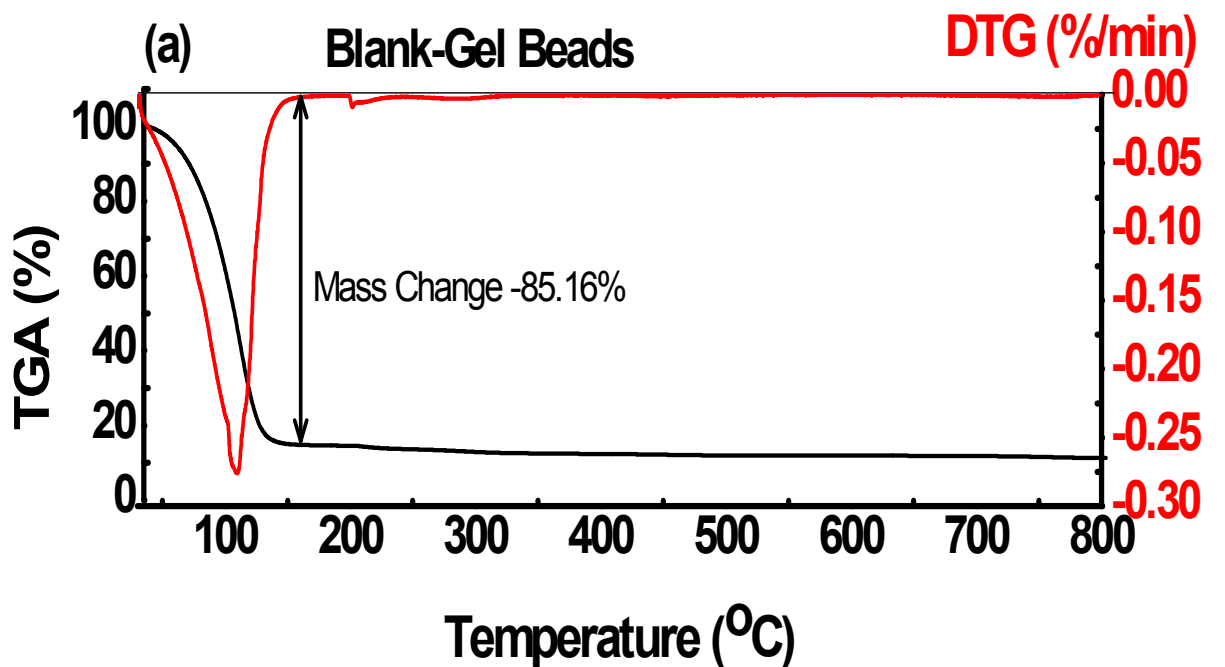


Fig. S1: TGA and DTG profiles of (a) the blank alginate beads & (b) the KNiHCF-Gel beads

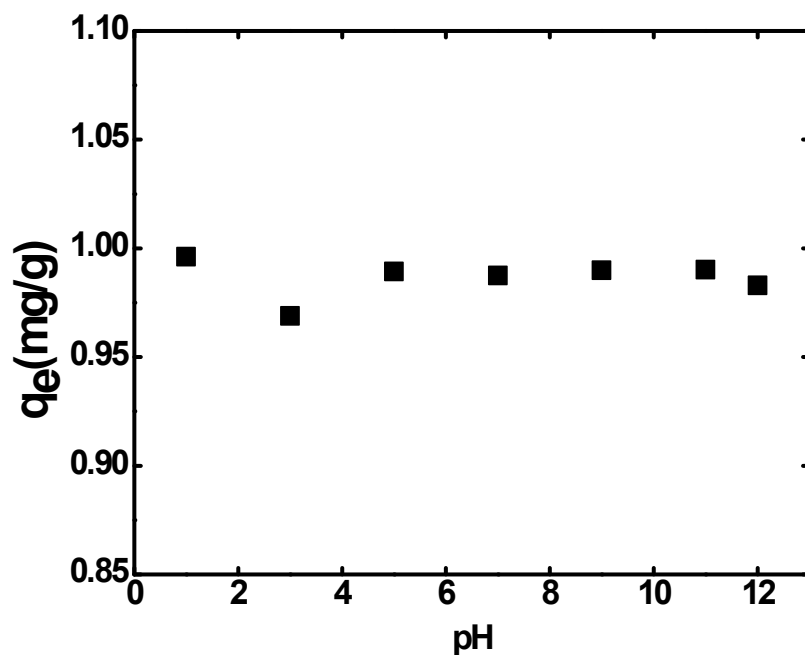


Fig. S2: Effect of pH on the sorption of cesium ions onto KNiHCF- Gel beads. The volume of the sample solution and mass of the swollen sorbent beads were 5 mL and 0.05g, respectively. The initial cesium ion concentration taken was 10 mg/L.

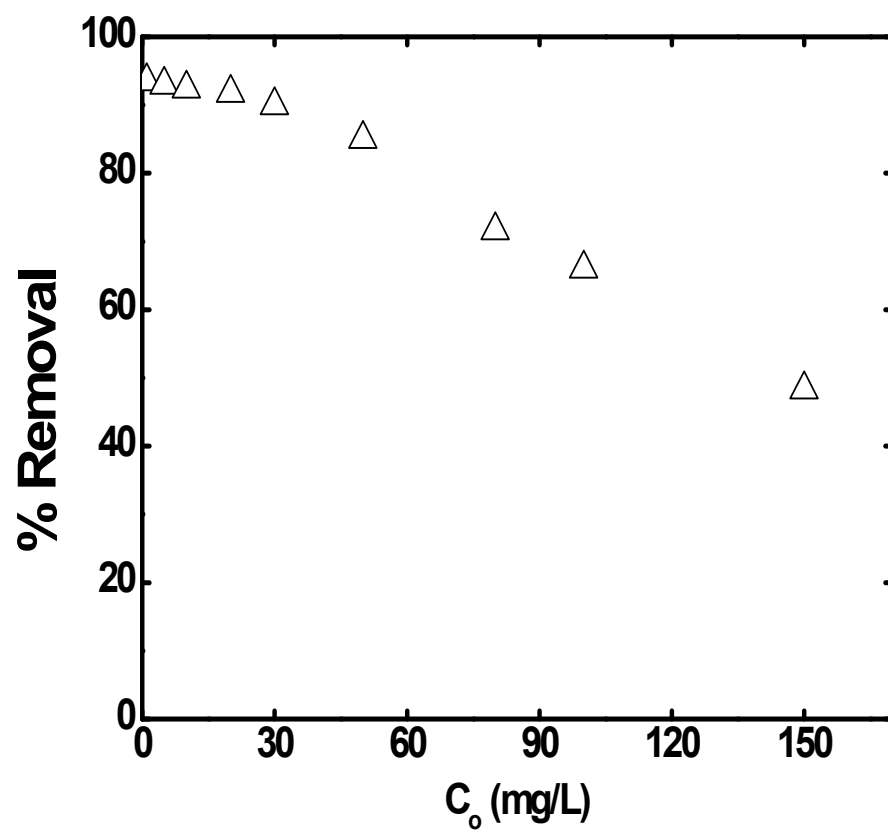


Fig. S3: Effect of initial cesium ion concentration on the percentage removal of cesium ions by the KNiHCF- Gel beads

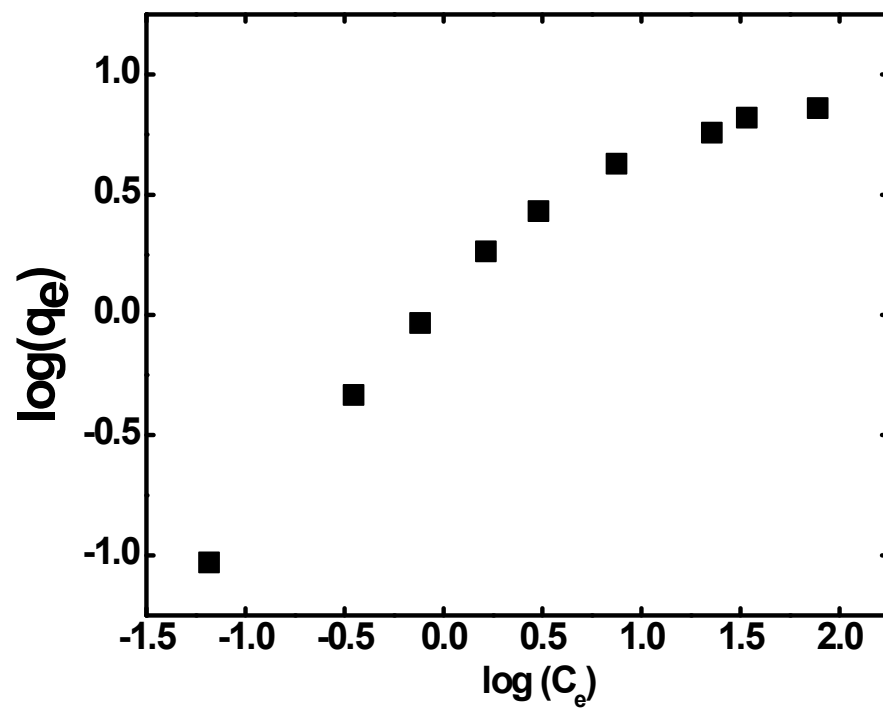


Fig. S4: Freundlich sorption isotherm plot for the sorption of cesium ions onto the KNiHCF-Gel beads at 293K

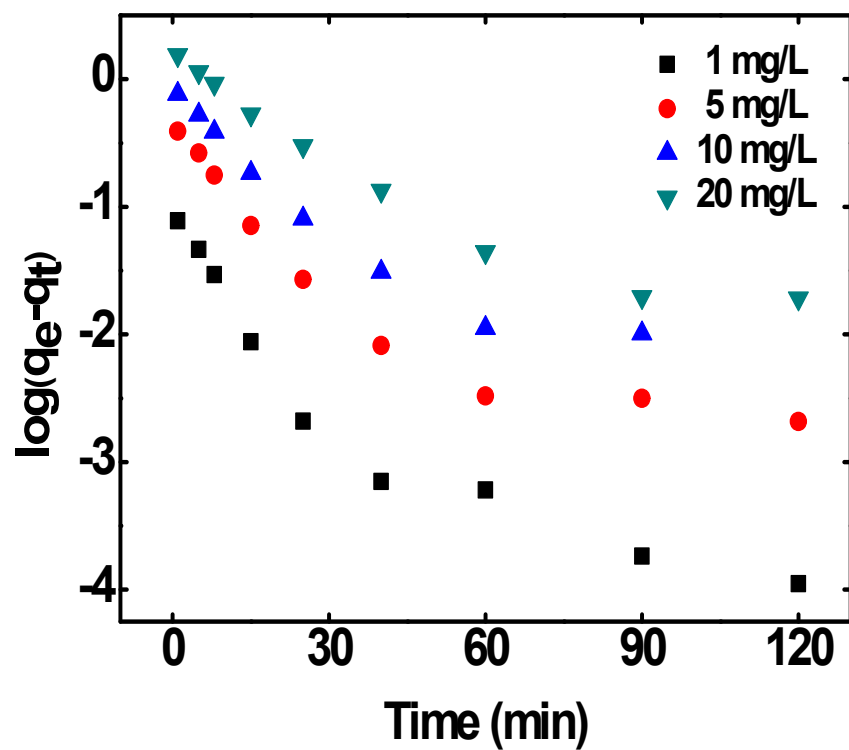


Fig. S5: Pseudo first-order kinetic plots for sorption of cesium ion onto the KNiHCF-Gel beads at different initial cesium ion concentrations

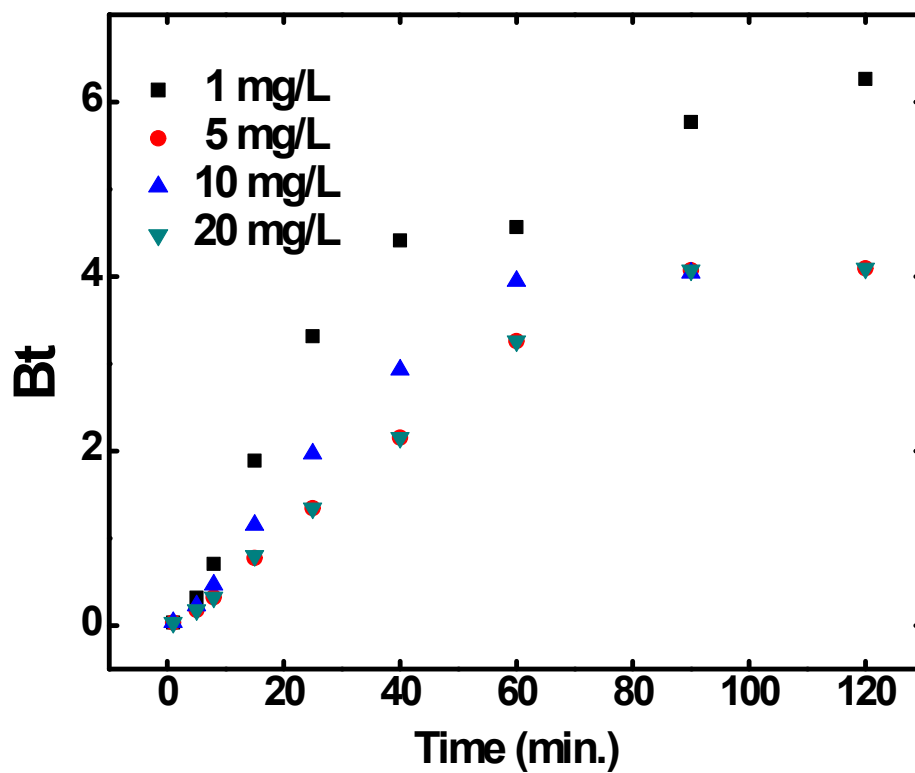


Fig. S6: Boyd's plot for sorption of cesium ions onto the KNiHCF-Gel beads at different initial cesium ion concentrations

Table S1: The pseudo first-order and the intraparticle diffusion model parameters for sorption of cesium ions onto the KNiHCF-Gel beads at different initial concentrations

Pseudo first-order model			Intra particle diffusion model		
C_0 (mg/L)	k_1 (min ⁻¹)	R_1^2	$q_{e(1)}$ (theoretical) (mg/g)	k_{id} (mg/g min ^{1/2})	I (mg/g)
1	0.054	0.827	0.026	1.06×10^{-4}	0.093
5	0.447	0.798	0.161	9.88×10^{-4}	0.463
10	0.052	0.873	0.473	40×10^{-4}	0.901
20	0.039	0.907	1.014	16×10^{-4}	1.697

Table S2: Effect of interfering ion concentration on the sorption of cesium ions onto KNiHCF-Gel beads at initial cesium ion concentration of 5 mg/L.

Interfering ion concentration (mg/L)	% Removal of Cs ⁺ ion in presence interfering ions		
	Na ⁺	Ca ²⁺	Ba ²⁺
0	99.71	99.71	99.71
4	99.37	99.43	99.69
16	99.51	99.67	99.57
32	99.56	99.50	99.61